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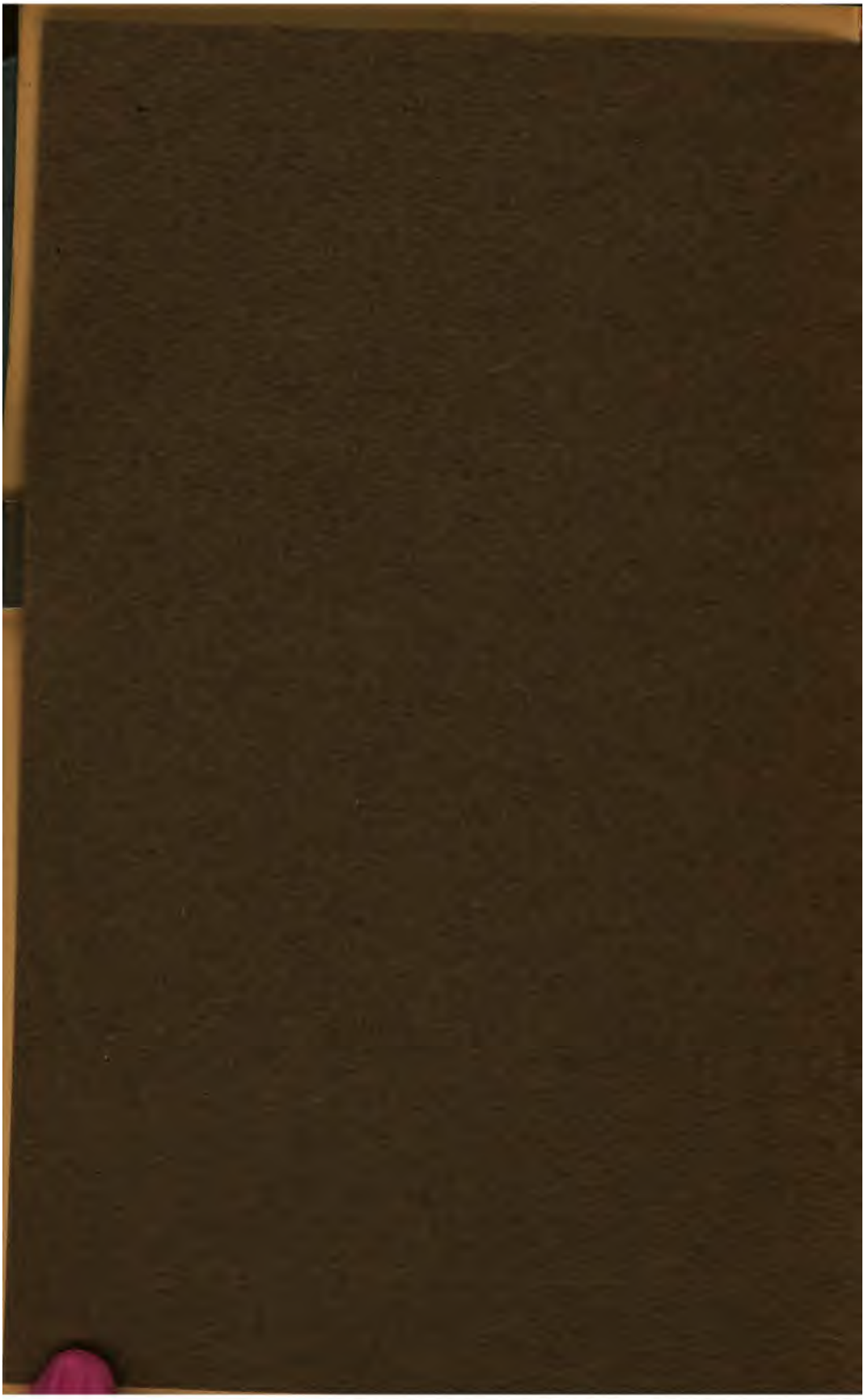

THE CAUSES AND EFFECTS

OF A

PUBLIC UTILITY COMMISSION

Address delivered before the Illinois Gas Association,
at Chicago, Ill., March 16, 1911,

BY

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OF THE MILWAUKEE BAR

Chairman of Railroad Commission of Wisconsin

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THE CAUSES AND EFFECTS OF A PUBLIC UTILITY COMMISSION.

Within the last few years a somewhat general demand for the enactment of laws creating public service commissions with power to regulate all public service corporations has arisen in many states. This seems to be but the natural and logical sequence of the regulatory measures respecting railroads and other common carriers now in effect in the nation and in most states. Whatever may be the views and attitude of those who manage and direct the affairs of such corporations in respect to the subject, the time has arrived when state surveilance of all corporations and individuals engaged in public callings is essential to the common weal. Unfortunately, however, the real reasons, justifiying such action on the part of the state have not always been advanced or been potent to create public sentiment favorable to such legislation. Much of the agitation has been and is based upon superficial and inconsequential grounds and emanates from a somewhat general conviction that most public service corporations are exacting exorbitant charges from the public for the services rendered, and are concealing the fact by paying moderate dividends upon a fictitious capitalization. While the view thus entertained is grossly exaggerated, it cannot be successfully controverted that over-capitalization, coupled with imprudent management, has frequently been a menace to the proper performance of the public functions of such corporations according to the full measure of duty imposed upon them by law as well as by voluntary contractual provisions. In such instances the eagerness of managements to demonstrate their administrative ability by declaring dividends upon stock results in the curtailment of operating expenses to such a degree that the rendering of efficient service becomes impossible, also in the neglect of proper maintenance of the property and in the failure to make provision for depreciation. Thus the public, on the one hand, is made to suffer by reason of poor service, and

the bondholders, on the other hand, are likely to suffer by reason of the diminution in value of their security. Under such circumstances, when replacements become necessary to the continuance of operation, they can be provided only by the issuance and disposal of additional securities. Thereby the capital account becomes charged with expenditures that should have been taken and saved from the operating revenues.

Much hostility, also, to the managements of public service corporations has been engendered by negotiations between municipalities and such corporations for the granting of franchises, which negotiations have not always been free from the suspicion that improper methods have been employed to induce those representing the public in the transactions to consent to terms and conditions detrimental to the public interest. As a result public service corporations are more or less a factor in local politics, and the manner of their regulation is often an issue in local political campaigns. This is unfortunate, both for the public and the corporation. The legitimate interests of both in the public utility are jeopardized. In the conflict neither seems to recognize its proper relation to the other, nor to realize that the effective regulation of a public service corporation, in respect to the performance of its public function, cannot be had by means of ordinances or contracts. As franchises are usually for a long term of years, it is obvious that the attempt to prescribe in detail the obligations of the public utility to the public, or *vice versa*, during the life of the franchise, must of necessity fail. No one can foresee a quarter of a century the changes in the arts embraced in public utility service, the development and necessities of the communities served, or the requirements of the utilities to perform their functions under conditions which must necessarily change in the progress of time. Less than two decades ago I saw in my home city an electric power plant just completed which was regarded the most modern and efficient plant of the kind in existence. Its capacity was regarded as enormous. Engineers and others interested in the advancement of the art of generating electric energy came from all sections of the country to view this plant which was equipped with the most modern appliances. For the past few years this plant has stood idle most of the time, serving merely as an auxiliary in emergencies. It is but an evidence of how rapidly the art has advanced and rendered obsolete the most expensive appliances. The advancement in the art of telephony within a very few years is little

less than marvelous. Costly equipments have been scrapped and entire systems reconstructed to meet the public requirement for the best service. In other utilities the changes have not been so marked and equipment has become more or less standardized, but who can tell what a quarter of a century may bring forth in any art or science? To meet the conditions as they arise is the only way that the best interests of the public and the utilities can be conserved in the matter of rates and service. Any franchise which attempts to anticipate the needs of the future in these respects and provide for the same, and most franchises do, sooner or later become inadequate to satisfy existing requirements and prolific of contention between the community and the utility. Even where the right to fix rates and establish standards of service from time to time has been reserved to common councils in such franchises, intelligent action upon the subject has been rare. The expenditure of large sums of money by the larger municipalities, to ascertain all the essential facts necessary for intelligent and lawful action on the part of common councils invested with power to establish rates, has more frequently been wasted than profitable, as the facts thus acquired have generally been ignored and action taken which was either prompted by prejudice or based upon ulterior political considerations. Litigation necessarily followed which involved the further outlay of large sums of money on the part of the public and the utility, all of which, in the end, had to be paid by the tax payers and patrons of the utility.

It was with a view of placing public utilities upon a sound basis and eliminating all unnecessary friction between the public and such concerns, due to causes arising from ignorance of the economic status of public utilities and their moral and legal relations to the public, that the Wisconsin Public Utilities Law was framed and enacted. The economic features of this law, which are fundamental in its structure, are the result of exhaustive study, investigation and consideration given to the subject by Professor John R. Commons of the University of Wisconsin. After more than three and one-half years administration of the law, the wisdom of the sound economic basis upon which the law was constructed has been demonstrated, and the results obtained from its operation have been generally satisfactory to the public, the utilities, and the investors in the securities of such concerns.

Among the more important provisions of the law are those relating to valuation, uniform accounting, standard units of pro-

ducts or service, publicity of rate schedules, fixing of rates and regulations, indeterminate franchises, and the purchase of public utility plants by municipalities. It will be impossible to consider at length the effects of all these various provisions without extending this discussion to an inappropriate length. However, reference will be made to the more important features of the law, that its general effects may be more fully appreciated.

The law requires the Commission to value "all the physical property" and "all the property actually used and useful for the convenience of the public" of every public utility subject to its provisions. There are over one thousand public utilities in the state which are under the regulation of the Commission. Of these the Commission has appraised to date about one hundred. The method of valuation adopted by the Commission, as shown by its decisions, is a subject of such magnitude that it cannot be touched upon here. Suffice it to say that no appeal has ever been taken by either a utility or a municipality from any valuation made by the Commission, and that the question of capitalization is no longer capable of seriously inflaming the public mind in any community in Wisconsin.

Very soon after the enactment of the law preliminary steps were taken by the Commission toward carrying into execution those provisions relating to the establishment of standards for the quality of service rendered by the public utility companies and to the enforcement of such standards in a manner consistent with the spirit of the law.

It was realized from the first that the proper administration of the provisions of the law relating to standards of service would necessitate the establishment of a circulating laboratory equipment to be used in fixing the legal units and standards and in putting the same into practice on a permanent and uniform basis throughout the state. After some preliminary discussions and conferences an agreement was entered into whereby the extensive laboratory facilities of the University of Wisconsin were, as far as practicable, made available for the purpose of the Railroad Commission, with the understanding that there should be reciprocal use of the instrumental equipment to be purchased subsequently by the Commission. This arrangement proved especially advantageous to the Commission, since it afforded an opportunity to act with deliberation in choosing the instrumental equipment ultimately required in handling the work on a large scale. Fol-

lowing closely upon the agreement with the university authorities above mentioned, the co-operation of the UNITED STATES BUREAU OF STANDARDS at Washington was solicited, with the further result that definite arrangements were made whereby the standards used in the administration of the Wisconsin Public Utilities Law shall, as far as practicable, be subject to verification and control with reference to the official government standards at Washington.

A further instance of important cooperative work during the preliminary period of developing standards and in the selection of testing equipment best suited to the demands of the situation in Wisconsin, consisted in the appointment by the AMERICAN GAS INSTITUTE of a special committee on gas calorimeters. One of the members of this committee was PROFESSOR C. F. BURGESS, who is in charge of the gas and electric service inspections for the commission. Part of the work of that committee was handled by

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NOTE: Sec. 1797m—3. Every public utility is required to furnish reasonably adequate service and facilities. * * *

Units of product or service. Sec. 1797m—22. The commission shall ascertain and prescribe for each kind of public utility suitable and convenient standard commercial units of product or service. These shall be lawful units for the purposes of this act.

Standard measurements; accurate appliances. Sec. 1797m—23. (1) The commission shall ascertain and fix adequate and serviceable standards for the measurement of quality, pressure, initial voltage or other condition pertaining to the supply of the product or service rendered by any public utility and prescribe reasonable regulations for examination and testing of such product or service and for the measurement thereof.

(2) It shall establish reasonable rules, regulations, specifications and standards to secure the accuracy of all meters and appliances for measurements, and every public utility is required to carry into effect all orders issued by the commission relative thereto. * * *

Measuring instruments; testing; fees. Sec. 1797m—24. (1) The commission shall provide for the examination and testing of any and all appliances used for the measuring of any product or service of a public utility.

(2) Any consumer or user may have any such appliance tested upon payment of the fees fixed by the commission.

(3) The commission shall declare and establish reasonable fees to be paid for testing such appliances on the request of the consumers or users, the fee to be paid by the consumer or user at the time of his request, but to be paid by the public utility and repaid to the consumer or user if the appliance be found defective or incorrect to the disadvantage of the consumer or user.

Public equipment for tests. Sec. 1797m—25. The commission may purchase such materials, apparatus and standard measuring instruments for such examinations and tests as it may deem necessary.

Entry upon premises. Sec. 1797m—26. The commission, its agents, experts or examiners, shall have power to enter upon any premises occupied by any public utility for the purpose of making the examinations and tests provided in this act and to set up and use on such premises any apparatus and appliances and occupy reasonable space therefor.

members of the Commission's staff, and the results of these investigations were made immediately available for use by Wisconsin gas plants.

Gas and Electric Service Inspections. The arrangements above outlined, it should be explained, while intended to apply to any phase of the question of units or standards which might arise under the Public Utilities Law, were naturally of more immediate use to the Commission in connection with gas and electric service.

A preliminary canvass of current practice relating to standards of gas and electric service elsewhere in the country threw but little light upon the question of fixing the proposed standards. In fact, it was at once realized that a special field study of the service actually rendered by the Wisconsin gas and electric companies would be a necessary preliminary to the intelligent formulation of the contemplated standards of service and the rules governing the same. In undertaking these field studies it became necessary to provide special field equipment which early took definite form as "traveling laboratories". After some progress had been made in this preliminary investigation, the results were thrown into shape to be presented at a general conference at Madison in March, 1908. At this informal hearing the owners and operating officials and experts of the various gas and electric companies of the state were given an opportunity to express their views in relation to the proposed standards of service. The program or outline of these discussions included the following points:

GAS SERVICE.

I. Accuracy of Meters.
1. Method of testing.
2. Limit of error allowable.

II. Calorific Value.
1. Importance.
2. Method of testing.
3. Minimum value.
4. Variation allowable.
5. "Gross" or "net" values.

III. Candle Power.
1. Importance.
2. How defined.
3. How measured.
   a. Kind of photometer.
   b. What standard.
   c. What kind of burner.
4. Minimum value.
5. Variation allowable.

IV. Composition.
1. Restriction as to impurities.
   a. Ammonia.
   b. Sulphur-total.
   c. Sulphur as H_2S.
   d. Diluents.

V. Installation.
1. Safety.
2. Adequacy.

VI. Pressure.

ELECTRIC SERVICE.

I. Accuracy of Meters.
1. Method of testing.
2. Limit of error allowable.

II. Uniformity of Voltage.
1. Allowable variation from normal.
2. Interruptions.

III. Lamp Efficiency.
1. What provisions for lamp renewals.
2. Voltage.

IV. Installation.
1. Safety.
2. Voltage limits.
3. Adequacy of wiring.

In addition to those directly representing Wisconsin interests there were present at this conference gas and electric experts from other states, and also an official representative of the government BUREAU OF STANDARDS. The proceedings of this conference were supplemented, upon request by the Commission, by communications received from those in attendance and from other sources. In the light of the information thus gathered and further important data brought together through the means of additional tests of service throughout the state, a preliminary set of rules relating to gas and electric service was formulated by the technical staff serving the Commission. After further conference and discussion, these rules were officially adopted by the Commission on July 24, 1908, to become effective three months thereafter (see decision No. U—21, *In re Standards for Gas and Electric Service in the State of Wisconsin*, 2 W. R. C. R. 632—662).

If one may judge from the large number of inquiries received from many sources during the two and one-half years since these rules were promulgated by the Commission, it is safe to say that gas and electric experts throughout the country have now become

familiar with the essential features of these Wisconsin rules relating to quality of gas and electric service. The writer therefore assumes that interest at the present time centers in the results attained through the enforcement of these rules rather than in the rules themselves. It is hoped that the following brief comments will throw some light on this phase of the question.

After adopting the rules a number of difficult questions presented themselves for solution. Among these none was more perplexing than that of determining upon the size of staff giving its time exclusively to the field inspections of gas and electric service. In the light of the facts gathered in the preliminary studies already referred to, it was decided to work out several plans for consideration and discussion. One of these plans contemplated the least possible expenditure which could conceivably keep the Commission informed, in a general way, as to the conditions throughout the state; a second scheme provided quite liberally for a staff and field equipment and was designed to place considerable emphasis on the immediate and vigorous enforcement of the rules; a third plan, calling for an expenditure intermediate between the other two, was adopted by the Commission and put into effect shortly after the rules were adopted. This organization, which has been slightly modified from time to time to meet changing conditions, at present provides for a field staff of nine men.

The entire staff of gas and electric inspectors at first made headquarters at Madison, but more recently the state has been divided up into three inspectional districts. One of these districts comprises the northeasterly section of the state with a resident inspector stationed at Appleton; a second covers the northwesterly portion with headquarters at Eau Claire; the remainder of the state, comprising the entire southerly portion and a narrow strip between the other two districts, is administered from the staff headquarters at Madison. The results obtained under this latter plan have proven satisfactory, both as regards the efficiency of the inspectional work and as to economy in administering the work of the staff.

In reviewing the work thus far accomplished by the inspections of gas and electric service under the Wisconsin Public Utilities Law, special interest centers in a statement submitted to the Commission covering the operations of the engineering staff for the fiscal year ending June 30, 1908. This statement, it should be borne in mind, was prepared in the light of an experience of con-

siderable less than one year's time, since active operations along technical lines under the Utilities Law began late in the calendar year 1907.

Following is a quotation from the statement referred to:

"The work performed by the special staff of experts engaged in inspections of gas and electric service consisted in the study of conditions existing in various cities of the state and included observations on the accuracy of consumers' meters; the accuracy of methods employed by gas and electric companies in standardizing such meters; the quality of gas as shown by chemical composition and heating value; the pressures at which gas was being delivered to consumers; the pressures and variations in pressure on electrical distribution systems; the efficiencies and deterioration of incandescent lamps; and various other factors relating to adequacy of service. Laboratory investigations have also been made on methods suitable for measuring quality of service, including a study of calorimeters suitable for determining heating values of gas. Special attention has also been given to the investigation of complaints of consumers to determine what factors are the more frequent causes for dissatisfaction. The aims of the work have been to furnish information useful in arriving at the operating values of certain gas and electric plants, to determine to what extent complaints of service made by consumers can be taken as a criterion of the quality of service rendered, and more especially the information was sought as a basis for establishing rules under which the companies may operate so that adequate service may be insured to the consumers.

"During the progress of these investigations numerous instances of poor and inadequate service were found. It appears that in the majority of such cases the defective service was the result of ignorance or neglect of the conditions due to the lack of suitable supervision or the lack of instruments necessary for studying the quality of service. It has been found that in various instances the companies have been needlessly hampered by certain municipal regulations, the purpose of which was to insure good service, but which were actually ineffective. Numerous instances of poor service have been rectified by the public service companies upon their attention's being called to the particular defects, and it has not been infrequent that such improvements have been made with little or no expense. It has been demonstrated that the consumers themselves are in some measure responsible for the maintenance of adequate service and it has been one of the purposes of the investigation to formulate information serviceable to the consumers in protecting their own interests."

Upon reviewing the foregoing quotation in the light of the further observations by the inspectional staff during the period of two years or more since these preliminary impressions were recorded, it may be said that little is to be added with respect to

the character and general scope of the work done by the staff. We cannot do better than to refer for details to the report of the work of the engineering staff contained in the annual reports of the Railroad Commission, particularly in the reports for the years 1909 and 1910. It has been a source of gratification to the Commission and to its staff that the rules for the regulation of gas and electric service adopted in 1908 should have stood the test of searching criticism directed against these rules from many sources. Among these criticisms none have been more searching than those of the Commission's staff itself, for it was scarcely hoped at the outset that a piece of pioneering work of this sort should escape considerable modification in the light of further investigation and experience. The rules themselves have stood in substantially their original form, although it has recently become evident that, in order to have uniformity in the interpretation placed upon the rules by the various inspectors and utilities, it would be desirable to explain many details with regard to the exact meaning of these rules. For this reason the inspectional staff, with the approval of the Commission, has adopted certain interpretations of these rules with regard to gas and electric service. Owing to lack of space, these interpretations will not be presented in this paper, but reference is made to a discussion of this phase of the matter which is to be found in the report of the work of the engineering staff for the year ending June 30, 1910.

Information gathered in the course of the preliminary studies by the Commission's staff in advance of the preparation and adoption of the formal rules made it plain that in the earlier stages of the administration of these regulations it would be necessary to provide for some flexibility, whereby those utilities which were unable to meet the prescribed standards at the outset could be given a reasonable opportunity to swing into line. The spirit of the Commission with respect to such concessions is clearly set forth in the following paragraph quoted from the discussion which formed a part of the decision (U—21) of the Commission promulgating the rules of service:

"If any management anticipates or experiences difficulty in complying fully with such rules and regulations, it is expected that application for a modification of the rule or rules with regard to which difficulties are encountered will be made to the Commission; but until a modification of any rule or regulation herein prescribed has been expressly authorized by the Commission, the gas and electric companies will be expected to comply strictly with the

terms of every rule and regulation ordered herein. It is possible that certain plants are operated under conditions which make it impracticable or not to the best interest of the public to meet all the requirements of all the rules. Under such conditions it devolves upon the utility to show to the Commission, by complete and convincing evidence, that a modification of some rule or rules should be made. Suggestions and criticisms are at all times welcomed by the Commission." 2 W. R. C. R. 632, 642.

With the development in the familiarity of operating conditions due to the more extended personal contact by members of the inspectional staff with the various local situations, it has of course become practicable to distinguish intelligently between instances of poor service where there was considerable justification for same, as distinguished from those cases where the application of the penalty provided by the law should ultimately be called for. During the past year, in particular, it has been the policy to follow up more persistently cases of serious violation of the rules. Without going into detail in this phase of the question, it may be stated in brief that there has been, with but few exceptions, a steady and gratifying response on the part of the managements of the various utilities in the direction of meeting the standards of service prescribed by the Commission. It was believed that by exercising due patience in this "follow-up" process, it might be practicable to avoid altogether the application of the penalties provided for infractions by the Public Utilities Law with respect to the quality of service. It was with much reluctance that the Commission was finally obliged to abandon this hope, since it has become necessary to take vigorous steps toward meeting the requirements of the law. Judging from the results of this recent action, there is reason to believe that the penalties need in future be applied only in very exceptional cases.

Summing up the experience thus far gained along the lines above discussed, it may be said that there has been a steady and distinct development throughout the state of Wisconsin towards the establishment of a better understanding between the managements of the utilities and their patrons. Just to what extent this change is due to the fact that there has been an actual improvement in the quality of service rendered, it is difficult to say; although it is certain that this phase of the matter has had considerable influence in bringing about a readjustment of the view-point of public utility officials. Some utilities, which had not given attention to the satisfactory maintaining of the service until obliged to do so, have

come to view the matter from another angle; and this readjustment of view-point, it is believed must necessarily, in the long run, lead to a cultivation of a spirit of legitimate pride in the quality of service rendered to consumers. The impression of those in contact with this work throughout the state is that the outlook is decidedly favorable.

The foregoing discussion of the quality of service has centered chiefly upon standards of gas and electric service and the administration of the same. Lack of time prevents going into detail with respect to field inspections relating to telephone service. These inspections have been made to a large extent by the staff busily engaged about the state in gas and electric service inspections, although during a part of the year the time of one skilled inspector is given exclusively to secret tests of the telephone service rendered by the principal exchanges throughout the state. A careful analysis and study of the data thus gathered, confirmed by a somewhat extensive contact through personal interviews and correspondence with the officials of telephone companies, warrants the belief that the general hopeful outlook with respect to the quality of service rendered by telephone companies is not essentially different from that just stated in regard to gas and electric utilities.

There has also been considerable activity along the lines of testing the quality of service rendered by water companies. These tests have related chiefly to the quality of the water supplied and to the charecter of fire streams provided in various cities and villages of the state. There has also been some agitation of the question of the accuracy of water meters. An equipment has been provided for making the field observations along these and related lines, and it is believed that considerable progress will be made in the next year or two in the establishment of a basis for interpreting adequacy of service in these utilities. Reference should also be made to some investigations which have been made relating to the quality of service supplied by heating companies.

Throughout these investigations, a large proportion of which have been of an entirely informal character, there has appeared to be a genuine appreciation of the fact that these matters, many of them the cause of much irritation, could be referred for adjustment to a body with investigating and regulating powers and having no interest whatever in the outcome.

The work of revising rates is probably the most readily appreciated feature of the Utilities Law. Conditions existing in Wiscon-

sin at the time of the enactment of that law were unquestionably bad. From a statistical study made in 1908, after the law had been in effect a full year, it was estimated that 55 per cent of the total number of utility plants had been charging discriminatory rates. The amount of free and reduced service was alarmingly large and often, as investigation showed, these discriminations were probably forced upon the operating company. In places schedules were so worded as to furnish more gas or electric current for less money. Frequently the utility was saddled with rates from which departure was impossible without arousing public prejudice.

Much of the work of adjustment accomplished since that time has been by informal correspondence or conference. Much of it has necessitated formal proceedings, investigations and orders, before reasonable and equitable rates could be substituted for those previously in force. In many instances it was found that, while the principles forming the basis of equitable rates were recognized as sound, few companies had the courage to change existing conditions and make readjustment of their own rate schedules in accordance with these principles, unless aided and sanctioned by the Commission.

The form of rate schedule placed in effect has, as far as possible, been prepared upon consideration of cost of service. It has given due recognition to the necessity of securing business for the company and thus obtain a lower average rate for the consumers, and has endeavored to obviate or correct the tendency to furnish certain classes of consumers at the expense of other consumers. It is gratifying to note the increase in business following the adoption of these schedules, and the interest and discussion that they have aroused in trade journals, and the voluntary efforts made by utilities to adjust their rate schedules upon a similar basis.

An important feature of the work in administering the Public Utilities Law, which is now nearing its completion, is the establishment of the uniform classifications of accounts. It will be recognized that before standards of efficiency and economy in management can be established, it is necessary to have comparative statistics, illustrating what has been and can be accomplished by the various utility plants. For this purpose a common schedule for reporting financial, operating and statistical information was devised, and a uniform classification of accounts prescribed to insure identity of treatment in reporting the separate items of balance sheet and income account.

The work of drafting a uniform classification of accounts presents many difficulties. Owing to the sweeping nature of the Utilities Law, the schedule must be made sufficiently elastic to include both privately owned and municipal plants, and furnish similar information for gas, electric, water, telephone, and heating utilities. It must place organizations, proprietorships, partnerships, and incorporations upon a similar basis. It must give recognition to the different methods of generation and distribution in each utility. It must provide for an effective and equitable separation of common expense items where two or more utilities, such as combined gas and electric plants, are conducted under one management, and, finally, it must be sufficiently elastic to furnish similar information for the large, the medium sized, and the small operating plant. The preparation of such classifications necessitated much co-operative work with the utility companies before what was deemed a practicable system of accounts could be produced.

These classifications have now been in effect for two years. In addition to the utilities operating under them in Wisconsin, numerous companies outside of this state have adopted the prescribed accounts with little modification. Thus far but few changes, and these of minor importance, have suggested themselves. Adaptation by the separate utilities was of necessity slow. A large amount of educational work is always necessary before radical departures in business methods are willingly accepted by men who have been in the business for a generation. Care was taken at the outset to insist simply that the returns provide the various groups of expenses and earnings called for in the classifications, leaving the utilities themselves to provide their own book-keeping practice in reaching the resulting figures called for. From the very beginning, however, the statistical and accounting department has been called upon to make suggestions upon such accounting matters as methods of controlling the distribution of the pay roll, accounting for stores and supplies, etc., —information which it rapidly equipped itself to furnish. In its work this department has gathered a large number of forms which, properly tabulated and indexed, serve as an elaborate reference work of utility accounting practice.

It is now recognized that the Commission cannot expect proper reports from some of the smaller utilities unless, in addition to supplying mere information, it renders practical assistance in re-

organizing systems of accounts. Wisconsin utility associations have recognized the same problem. At present the State Telephone Association has employed expert accountants to draft in consultation with the Commission all accounting forms necessary for the smaller telephone companies. I believe it is the purpose of this association to print and distribute these loose-leaf forms at cost to members of the association. Similar standardization of business procedure is expected in the water, gas and electric utility lines.

The expense and effort necessary to secure the statistical information has paid for itself from the start. The financial schedules, as filed with the Commission, have served a variety of purposes. They have indicated the growth of the utility business and have formed the basis of information submitted in rate cases. They have been widely used and quoted by persons interested in the financial standing of individual plants. They have formed the only reliable means of comparing operating conditions of one plant year by year, or of similarly situated plants during a single year.

A unique and important feature of the Wisconsin system of accounts, in which it differs from similarly prescribed classifications in other parts of the country, and concerning which it was submitted at first to much criticism, is that it endeavors to serve as a basis for ascertaining the cost of service. It was early recognized in Wisconsin decisions that the cost of furnishing public service is an important element in fixing reasonable rates. Accounting information which cannot show what utility or what class of service is conducted at a loss, does not fulfill its purpose as a financial report and does not justify the expenditure of much time and money.

The insistence that expenses be charged to the public service for which they are incurred, has led to some significant results. An instance is recalled where a company operating a gas, electric and street railway business in two states made "rule of the thumb" apportionment of its general and other common expense items as between the various departments of its business. An investigation showed that with readjustment of amounts charged to these accounts, certain reductions were properly made in the electric rates of the company. Since that date this company has been one of the most ardent advocates of the classification of accounts. It has recently changed its method of generation, made its own calcula-

tions and voluntarily reduced its rates for electric service below those previously ordered effective by the Commission. Municipally owned plants were found to have generally failed to credit the time of the city treasurer, city clerk and city engineer to the water or lighting utility business. Frequently a city assumed and repaid all bond issues utilized in construction of the utility plant and accrued interest from the general fund. In only scattering instances was any allowance made for depreciation. On the other hand, it was found that no credit had been given for services used by the municipality. These instances might be multiplied at great length. It may be stated, however, that what progress has thus far been made has demonstrated the feasibility of a cost of service classification of accounts.

Some additional work is necessary before some of the schedules submitted to the Commission can be accepted as correct for statistical purposes. Certain essential features of reports must be verified by inspection. The companies' methods of apportioning common expense items between the different services rendered, their practice of distributing labor costs and of handling maintenance accounts and depreciation reserves must be inquired into.

It has seemed clear that the small utility occupies a very important position in Wisconsin, both as regards number and as regards the population served by it. In order to demonstrate the relative importance of the large and small utility, I have prepared a table covering all the water, gas and electric utilities in the state, and have divided these into two groups, one of which includes all utilities operating in cities of over 10,000 population, and the other, cities under 10,000 population. This table shows the total population served by the several utilities included in these groups, the value of the property and plant of the utilities, the number of utilities, their total operating revenues and expenses, the total number of consumers furnished with service, and the total connected load of the electric utilities. This table will show that of 110 water utilities 90, or 82 per cent, are located in cities of under 10,000 population; of 48 gas utilities, 28 are small plants; of 163 electric utilities, 143 are in cities of under 10,000 population. Again, it will be noted that the cities in the state supplied with electric service have a total population of nearly 1,000,000, of which total over 30 per cent is supplied by utilities in cities of under 10,000 population. If we exclude Milwaukee from the group of larger cities, the percentage supplied by small utilities becomes 45 per

cent. Of the total number of electric consumers in the state it will be noted that the small utilities supply 46 per cent.

The table shows a number of other ratios which still further emphasize the importance of the small utility in Wisconsin.

I have excluded telephone and electric railway companies, because of the fact that these utilities quite often supply more than one city, and have considered that the water, gas and electric plants are sufficient to demonstrate the importance of the small utility.

IMPORTANCE OF SMALL UTILITIES IN WISCONSIN.

(Reports for year ending June 30, 1909.)

	Cities over 10,000			Cities under 10,000		
	Water	Gas	Electric	Water	Gas	Electric
Population served.....	683,199	683,199	683,199	152,336	76,044	301,122
Value of property and plant	$16,467,261	$23,057,293	$19,503,203	$5,711,395	$1,175,037	$4,324,143
No. of utilities.....	20	20	20	90	28	143
Total operating revenues	$1,503,979	$3,473,530	$2,646,039	$526,830	$229,001	$1,035,770
Total operating expenses	$666,763	$2,267,603	$1,645,633	$346,841	$205,155	$837,576
* Total number consumers	107,756	109,667	33,340	31,447	6,867	27,845
Total connected load in kws.	.....	.....	67,450.7	.....	.....	23,306.7

* Water consumers includes all services, both public and private. Electric consumers does not include street lights.

PERCENTAGE DISTRIBUTION.

	Cities over 10,000			Cities under 10,000		
	Water	Gas	Electric	Water	Gas	Electric
Population served	82%	90%	69.5%	18%	10%	30.5%
without Milwaukee..	71	83	55	29	17	45
Value of property and plant	74	95	82	26	5	18
without Milwaukee.	64	89	74	36	11	26
Number of utilities.....	18	41	13	82	59	87
Total op. revenues.....	75%	94%	72%	25%	6%	28%
without Milwaukee..	63	86	61	37	14	39
Total No. consumers...	78	94	54	22	6	46
without Milwaukee.	64	87	47	36	13	53
Total op. expenses.....	66	92	67	34	8	33
without Milwaukee..	55	83	53	45	17	47
Total connected load in kws.	.....	.....	75	.....	.....	25
without Milwaukee..	.....	.....	64	.....	.....	36

In view of the figures shown in the tables, it is clear that the Commission is amply justified in devoting considerable attention to the small utility. The assistance given to small utilities by the Commission may be roughly divided into three general heads: accounting, engineering, and statistical. A point to be noted in this connection is that the Commission is not encroaching upon the private practice of engineers and accountants to any appreciable extent in giving engineering and accounting advice to small utilities. In fact, the Commission is increasing the field of operation for engineers and accountants in private practice by demanding of the smaller utility better service and better records, and bringing to their attention the importance of these features. In requiring annual reports of all utilities, based upon a uniform classification of accounts, the Commission has furnished utilities with a logical and reasonable system of accounts. In requiring good service of utilities, the Commission has compelled more efficient operation and management. Mere contact on the part of these utilities with the Commission's engineers and inspectors and members of the statistical and accounting departments has in itself been of valuable service to the small utility. Inspectors, when visiting utilities and making routine tests and inspections, are able to suggest

to the operators many changes which work towards better service and more economical operation.

It is a fact that the electric, water works and gas associations have not devoted much attention to the small utility. It is only reasonable to expect that the managers of large utilities shall dominate the work of conventions of these associations. The small utility manager naturally hesitates to bring his troubles before such associations, and the Commission, in a sense, occupies toward the small utility a position which should be taken by these various associations. It is not intended to criticise these associations, because the work done by them is of tremendous scope and importance; nevertheless, it will hardly be disputed that the small utility has not received the consideration which its importance, especially in Wisconsin, would justify. There is an increasing number of informal matters which come to the attention of the Commission involving the small utility, both private and municipal. Quite a few small electric utilities are lately begining to give day service. Practically in all of these cases the Commission has been requested to determine a fair rate for this service. In a number of small cities disputes have arisen between the city and the lighting plant in regard to the rates for street lighting. Rather than enter a formal complaint and have a formal hearing, the city and utility have agreed to submit the matter to the Commission informally, and have the Commission determine upon a fair rate. In a number of cases small utilities have asked the Commission to revise their entire schedule of rates. In order to facilitate work along these lines it is intended to publish the rates, rules and regulations of all the utilities in the state, and by comparison and by the use of hypothetical plants, to demonstrate what are reasonable rates, rules and regulations.

I have brought these figures and points to your attention, wishing to emphasize the important position that the small utilities in Wisconsin occupy and the matters in which the Commission assists the small utility. In connection with this matter I would like to submit for your consideration an outline of the information which is necessary in working out a schedule of rates for electric utilities. It is intended by this outline to show in brief form the principal facts which should be available in working upon a schedule of rates. It is intended to follow this outline by selecting from among certain types of plants, such as a steam plant in a city of under 5,000, a plant of normal investment and normal operat-

ing expenses, and showing the figures for this plant, to work out a schedule of rates and set down certain reasonable rules and regulations which will serve, in a manner, as a guide for plants of this character.

I. General Information.

1. Location of plant.
2. Population of city supplied.
3. Municipal or private plant.
4. Method of generation.
   (a) Steam.
   (b) Hydraulic.
   (c) Gas.
   (d) Combined.
5. Is utility operated singly of in combination with a water, gas or other utility?
6. Branches of service rendered.
   (a) Lighting.
      Municipal lighting.
         Street lighting.
            Arcs.
            Incandescents.
         Public buildings.
            Arcs.
            Incandescents.
      Commercial lighting.
         Residences.
         Business houses.
         Factories.
   (b) Commercial power.

II. Valuation of Plant.

1. Book value.
2. Original cost.
3. Additions or extensions since plant was first built—by years.
4. Cost of reproduction new.
5. Present value.
6. Going value.
7. Working capital.
8. Details of investment.
   A separation of investment into land, buildings, power plant equipment, distribution system, etc.
   Statement of equipment—inventory.
9. Apportionment of investment.
   Where plant is a combined water and electric plant, gas and electric, etc., the investment should be apportioned between the several utilities according to actual use where this is feasible, or on some reasonable basis.

Where street lighting, commercial lighting, and commercial power or other classes are served, an apportionment of the investment between these classes is necessary.

10. Unit costs of investment.
    For purposes of comparison, analysis and as a basis for analyzing expenses, a number of unit costs of investment should be obtained, as illustrated below:
        Power plant equipment kw. of generator capacity, per consumer.
        Distribution system per mile of main; per consumer.
        Services per consumer, etc.
11. Percentage distribution of investment.
    Proportion of total plant investment represented in land, buildings, power plant, equipment, distribution system, etc.
12. Physical Data.
    No. of boilers and rated capacity—h. p.
    No. of engines, turbines, water wheels, etc., and rated capacity of each in kws.
    No. of generators and capacity of each, kws.
    Miles of wire—different systems or circuits.
    No. of services and meters, etc.

III. Consumer Data and Operating Statistics.

1. Connected load.
    (a) Total.
    (b) Of each class of service.
2. Maximum demand.
    (a) Peak load on station.
    (b). Demand of each class of consumers or branch of service, and time of such demand.
3. Output.
    (a) Current generated.
        Total.
        For each class.
    (b) Current sold.
        Total.
        For each class.
    (c) Monthly variation of total sales and sales to each class.
4. Detailed consumer data.
    (a) Current sold to, and installation of each consumer for year.

IV. Earnings and Expenses.

1. Statements of earnings and operating expenses each year from date of installation.
2. Indebtedness and interest rates.
3. Stock issues and dividends paid.

4. Unit costs.
   This should show the unit costs of operation each year per kw. hr. output. Principal items, such as fuel, labor and repairs should be computed on bases of unit cost per unit generated, per kw. generator capacity, per consumer, per meter, per mile of wire, etc.
5. Percentage distribution of operating expenses.
   Proportion of total operating expenses each year which is represented in generation, distribution, consumption, commercial, general, and undistributed expenses, and taxes.
6. Normal year.
   The year selected as that whose expenses shall be the basis of the rates must be a normal year. This may be determined by comparison of total cost and unit costs of the several items with the same items for other years. Curves showing the variation of the chief items of expense year by year may be constructed.
7. Depreciation.
   (a) "Straight line" basis.
   (b) "Sinking fund" basis.
   (c) Per cent of total property.
8. Reasonable return.
   (a) Interest earned.
   (b) Local conditions as affecting rates of return to be allowed.
   (c) Condition of plant.
   (d) Service.
   (e) Probably future growth of utility.
   (f) Competition.
   Etc.

Since 1907 the Commission has disposed of 207 formal utility cases and 886 informal cases. It has passed upon 142 stock and bond certificates, the majority of which were granted upon application for increase in capitalization of public service corporations. While it may be somewhat early to describe definitely what has been accomplished under the law, it may be said that certain tendencies for better conditions, better feeling between consumers and utility are apparent in Wisconsin. The work of the Commission and the co-operation of the utilities under the provisions of the Utilities Act have been jointly responsible for this betterment.

The extension of utility business since the operation of the law has been very gratifying. Electric utilities in the state during the last year have increased their operating revenues 20 per cent and

their income 29 per cent. New construction for the year has increased 145 per cent over that of the preceding year. The water utilities have increased their operating revenues 7 per cent, their net income 13 per cent and construction for the year 24 per cent. Gas utilities have increased their operating revenues 8 per cent, their net income 15 per cent and new construction for the year 22 per cent. Telephone utilities have increased their operating revenues 11 per cent, their net income 9 per cent and new construction during the year 14 per cent.